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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/721,936

11/25/2003

Karl Barth

P03,0445

8331

26574

7590

10/25/2007

SCHIFF HARDIN, LLP  
PATENT DEPARTMENT  
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CHICAGO, IL 60606-6473

EXAMINER

LIEW, ALEX KOK SOON

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

10/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/721,936

Applicant(s)

BARTH, KARL

Examiner

Alex Liew

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2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

The amendment filed on August 9, 2007 is entered and made of record.

### **Response to Applicant's Arguments**

1. On page 8, the applicant stated:

Applicant submits, however, that the highly schematic illustrations shown in Figures 8 and 9 do not represent a transformation of the surface (i.e. the surface of the femur 84 in the example of Crook). In the Crook reference, despite the division into voxels and the subsequent conversion of one surface of each voxel into the representation shown in Fig. 9, the actual surface always remains curved. The graphical representation shown in Figure 9 is not intended to be a representation of the actual surface of the femur 84, but is merely an intermediate step in the generation of data that will then be supplied to a CAD program in order to produce the representation shown in Fig. 10.

The applicant is correct, the fact that in Crook, the segmented slice image remain curved. Then on page 9, the applicant stated:

Therefore, the representation shown in Fig. 9 of the Crook reference does not constitute a "computationally uncurved and flattened" (i.e. "unrolled") representation of the segmented curved surface into a plane and moreover, the representation shown in Fig. 9 of Crook et al is not display in a display presentation together with the three dimensional image, as set forth in claim 1 of the present application.

The examiner agrees that Crook does not disclose computationally uncurved and flatten representation of the segmented curved surface into a plane. However, the examiner found Staehle (US pat no 7,120,298); Staehle discloses computationally uncurved and

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flatten representation of the segmented curved surface into a plane (see figure 4, shows a circular image using polar coordinate, then in figure 4a, the circular region is unwrap into rectangular form). The 'unwrapping' procedure is read as uncurving and flattening the segmented curved surface.

The examiner will make rejection to include Crook and Staehle references.

With regards to the Double Patenting rejection made in previous rejection, the examiner will withdrawn it because the amended claim 1 of the copending application (10/721,931) does not anticipate the limitations of the amended claim 1 of current invention.

### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crook (US pat no 5,452,407) in view of Staehle (US pat no 7,120,298).

With regards to claim 1, Crook discloses a method for producing an image, comprising the steps of

in a computer, storing a three dimensional image of an object as a volume dataset and segmenting a curved surface of the stored three-dimensional image (see column 4, lines 28 to 34, the image data is downloaded to a workstation as CAD format, the image stored is shown in figure 5)

transforming the volume dataset and the segmented surface to transform the segmented curved surface into a plane (see figure 6 – the image is segmented by dividing the femur into grids) and

displaying three-dimensional image in a display presentation and, in said display representation (see column 1, lines 36 to 42), representing the transformed curved surface of the three-dimensional image as a planar slice of a predetermined thickness, coplanar with said planar at least one location selected in said display presentation from the group consisting of inside the three-dimensional image and outside the three-dimensional image (see figure 7b, element 86, the thickness is one unit vowel).

Crook does not disclose computationally uncurving and flattening representation of the segmented curved surface into a plane. Staehle discloses computationally uncurving and flattening representation of the segmented curved surface into a plane (see figure 4, shows a circular image using polar coordinate, then in figure 4a, the circular region is unwrap into rectangular form). The 'unwrapping' procedure is read as uncurving and flattening the segmented curved surface.

One skilled in the art would include uncurving and flattening steps because displaying image in rectangular form has always been a norm in image processing, making the images simple to read and faster to locate desire region of interest.

With regards to claim 3, Crook discloses a method as claimed in claim 1 comprising employing an image of at least a part of a living subject as said three dimensional image and wherein said surface is a body surface of the living being (see figure 3, element 40, the scanner scans surfaces of a human).

With regards to claim 4, Crook discloses a method as claimed in claim 1, comprising selecting said subject from the group consisting of a bone of a living being and an organ of a living being (see figure 5).

With regards to claim 7, Crook discloses a method as claimed in claim 1, comprising representing image data allocated to said slice of predetermined thickness by volume rendering (see figure 6, the femur is divided into three dimensional grids).

3. Claim 2 is rejected under U.S.C. 103(a) as being unpatentable over Crook ('407) in view of Staehle ('298) as applied to claim 1 further in view of Essinger (US pat no 4,939,646).

Crook discloses all the limitations discussed in the rejection for claim 1, but does not disclose converts each of the cross section from Cartesian coordinate to polar coordinate. Essinger discloses performing a coordinate transformation for a cross sectional image slice to polar coordinates relative to a line extending through the three-

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dimensional image that is oriented substantially perpendicularly to slice image (see figure 4 – step 43), determining contours that are imaged in transformed slice image and allocate to the surface of the three-dimensional image (see figure 4 – step 44 – the points needed to calculate spline coefficients are on the cross section image in polar coordinate form,  $r_i$  and  $\theta_i$ ), transforming the pixels of the contours back into the coordinate system (see figure 4 – step 46). Crook discloses extracting pixels along said contours for representing the surface of the three-dimensional image, after transformation of the image into the plane with said slice of predetermined thickness (see figure 7b). One would re-extract the three-dimensional shape of the object is because to compare changes occur after the calculation of the spline coefficients, shown in figure 4 – step 46, where the results are being display. One skill would include a step of transforming each cross sections into polar coordinate system because to extract a series of functions which describes the shape of the object (see column 3 lines 10 – 16), to allow the user or doctor to examine if there is any disease present.

3. Claims 5 and 6 are rejected under U.S.C. 103(a) as being unpatentable over Crook ('407) in view of Staehle ('298) as applied to claim 1 further in view of Wood (US pat no 5,283,837).

With regards to claims 5 and 6, Crook discloses all the limitations discussed in the rejection for claim 1, but does not disclose orienting plane along a line. Wood discloses orienting a three-dimensional image (see column 3 lines 60 – 66), where each image

place are being rotated each time, when rotation of the three-dimensional image is made and also the rotation axis is the line of sight toward and away from the three-dimensional image. One skill in the art would include step of rotating the three-dimensional image because to find areas of the three-dimensional image, which has potential disease tissues such as cancer, by viewing all 360 degrees of the living object, to improve disease detection.

4. Claim 8 is rejected under U.S.C. 103(a) as being unpatentable over Crook ('407) in view of Staehle ('298) as applied to claim 1 further in view of official notice (MPEP 2144.03).

Crook discloses all the limitations discussed in the rejection for claim 1, but does not disclose applying filtering process such as smoothing, edge-accentuation and structure-accentuation. Crook do teach applying a filtering process through the three dimensional image (see figure 11 – 96). However, it is well known in the art of image processing to use smoothing, low pass filter, and edge-accentuation, sober operator on an image. One skill in the art would include such steps because to extract addition details or remove noise, to improve the quality of the image.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP



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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alex Liew  
AU2624  
10/19/07

A handwritten signature in black ink, appearing to read "Matthew C. Bella". The signature is fluid and cursive, with the first name "Matthew" being more prominent than the last name "Bella".

MATTHEW C. BELLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600